



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Richa Singh	Project Number S0628
Project Title Solving Flint's Lead Detection Problem: A Rapid, Low-Cost Test via a Chromophoric Reaction	
Abstract Objectives/Goals In 2014, Flint's water was contaminated with lead and other metals from their pipes. Residents in the area couldn't afford lead test kits since they are very expensive, so they didn't realize their water was contaminated until it was too late. This project solves this lead detection problem. A rapid and inexpensive (\$1) test for lead contamination in water was created so that everyone could easily test their water. Methods/Materials For this project, sodium rhodizonate, vinegar, and lead nitrate were primarily used. The sodium rhodizonate and vinegar were used to create a mixture so that when the mixture came in contact with lead in the water, it would change color. The lead nitrate was used as a safer substitute for pure lead hydroxide. The lead nitrate was only used to experiment whether the test worked. The vinegar was used to act as a catalyst for the chromophoric reaction to occur between the sodium rhodizonate and lead. Results When the 0.05M concentration of lead was tested, the test worked with 100% accuracy, and the color would change from orange to purple or dark red. When the 0.0001M concentration of lead was tested, the test worked with 82.5% accuracy, and the color would change to pink or red. When the tap water was tested, the test worked with 100% accuracy, and the color would either stay orange or turn yellow, indicating safe levels of lead in the tap water. Conclusions/Discussion The results show that this test is very consistent and reliable when being used to test for lead contamination in water samples. It is also very inexpensive, being only about \$1, and can be easily done by anyone who is worried about the quality of their tap water. This test can be used to prevent future incidences similar to Flint and allow everyone to be assured that their water is of pure quality.	
Summary Statement In this project, a test was created to easily, rapidly, and inexpensively test for lead contamination in water samples.	
Help Received My parents helped to obtain the materials for the experimentation, and Mrs. Gillum, my teacher, helped guide me through the science fair process.	